

# **Final Report for the Decontamination and Decommissioning of CPP-627 Remote Analytical Facility**

February 2006

**Idaho  
Cleanup  
Project**

The Idaho Cleanup Project is operated for the  
U.S. Department of Energy by CH2M • WG Idaho, LLC

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# **Final Report for the Decontamination and Decommissioning of CPP-627 Remote Analytical Facility**

**February 2006**

**Idaho Cleanup Project**

**Idaho Falls, Idaho 83415**

**Prepared for the  
U.S. Department of Energy  
Assistant Secretary for Environmental Management  
Under DOE Idaho Operations Office  
Contract DE-AC07-05ID14516**

## **ABSTRACT**

This report describes the decontamination and decommissioning (D&D) effort at the Idaho Nuclear Technology and Engineering Center at the Idaho National Laboratory (INL) Site. This D&D project was performed as part of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Non-Time Critical Removal Action that began in February 2004 and was completed January 2006.

The primary objectives of this D&D project were to (1) eliminate potential safety hazards and exposure to hazardous materials and (2) dismantle and dispose of the building in support of the acceleration of the footprint reduction at the INL Site.

The D&D operations for this project consisted of D&D tasks such as utility isolations, equipment removal, decontamination, hazardous material removal, and disposition of materials and the building structure. The CPP-627 Remote Analytical Facility building was dismantled to the concrete slab and disposed of in the Idaho CERCLA Disposal Facility.



## **SUMMARY**

In 2003, the Department of Energy (DOE) requested that the Idaho Completion Project (now the Idaho Cleanup Project) reduce the Environmental Management (EM) footprint as part of the EM Performance Management Plan for Accelerating Cleanup of the Idaho National Laboratory. Specifically, in December 2003 DOE challenged the Clean/Close Idaho Nuclear Technology and Engineering Center Project to remove a total of 34 buildings and structures by the end of January 2005.

This final report describes the tasks performed to accomplish the decontamination and decommissioning (D&D) of the CPP-627 Remote Analytical Facility, which totaled 14,727 ft<sup>2</sup>. The D&D of this building was completed under a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Non-Time Critical Removal Action. The building was demolished to the existing concrete slab and disposed of in the Idaho CERCLA Disposal Facility. An additional layer of concrete was placed over the existing building slab to preclude infiltration of water and migration of the contaminants below the slab.



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## ACRONYMS

|        |   |
|--------|---|
| BBWI   | Bechtel BWXT Idaho, LLC   |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CPP    | Chemical Processing Plant   |
| D&D    | decontamination and decommissioning                                   |
| DAR    | Document Action Request   |
| DDL    | Decon Development Lab   |
| DOE    | U.S. Department of Energy   |
| ECF    | Engineering Change Form   |
| EDF    | Engineering Design File   |
| ESL    | Emission Spectroscopy Lab   |
| FCF    | Facility Change Form  |
| HCL    | Hot Chemistry Lab   |
| ICDF   | Idaho CERCLA Disposal Facility  |
| ICP    | Idaho Cleanup Project   |
| INL    | Idaho National Laboratory   |
| INTEC  | Idaho Nuclear Technology and Engineering Center                       |
| MCC    | Multi-Curie Cell  |
| NTCRA  | Non-Time Critical Removal Action                                      |
| OSL    | Old Shift Lab   |
| PCB    | polychlorinated biphenyl  |
| RAF    | Remote Analytical Facility  |
| RCRA   | Resource Conservation and Recovery Act                                |
| TSCA   | Toxic Substances Control Act  |



# **Final Report for the Decontamination and Decommission of the CPP-627 Remote Analytical Facility**

## **1. INTRODUCTION**

This final report provides (a) a brief description of the Chemical Processing Plant (CPP) -627 Remote Analytical Facility (RAF), (b) the drawings that were revised or inactivated, (c) waste volumes generated for the project, and (d) the costs for the completion of the project. This final report was written in accordance with the requirements of the “Deactivation, Decontamination, and Decommissioning Project Manager’s Handbook” (PLN-1053) and DOE O 430.1B.

The alternative selected for the CPP-627 building was decontamination and decommissioning (D&D) by means of equipment removal, decontamination, and final demolition of the facilities, followed by safe and proper disposal of components. Figure 1-1 is an aerial view of the Idaho Nuclear Technology and Engineering Center (INTEC) complex showing the location of the CPP-627 building that this final report addresses.



Figure 1-1. Aerial view of the INTEC complex showing the location of the CPP-627 building addressed in this final report.

## **2. CPP-627 OPERATING HISTORY**

CPP-627 (Figure 2-1) is a 14,727-ft<sup>2</sup> facility entirely above ground and is adjacent to and attached to CPP-601. This facility, constructed in 1955 of reinforced concrete and masonry block, has been inactive since 1989. CPP-627 included the Hot Chemistry Lab (HCL), the Old Shift Lab (OSL), the Multi-Curie Cell (MCC), the Emission Spectroscopy Lab (ESL), and the Decontamination Development Lab (DDL).

CPP-627 housed analytical, experimental, and decontamination facilities. The northern third of the building housed the analytical facilities. The RAF section of the building consisted of two lines (A&B Lines) of shielded gloveboxes for remote sample preparation and analysis and occupied the ground floor. The OSL, which occupied the second floor, provided bench and hood space for chemical analyses. Analytical services were provided around the clock to support fuel processing operations.

The middle third of the building was a high bay decontamination facility, providing space for water and chemical cleaning of contaminated equipment. The decontamination facility was replaced in 1980 by the new decon cell at the New Waste Calcining Facility. The original equipment was removed and the area was rebuilt into the DDL and the ESL. The second story provided a fan and filter loft for handling off-gas from some radioactively contaminated portions of CPP-627.

The southern third of CPP-627 contained two experimental facilities, the HCL and the MCC. The HCL consisted of lab benches, hoods, and shield gloveboxes. The MCC was designed for experiments using fully irradiated fuel. Both the HCL and MCC were used for the Custom Fuel Dissolution process. Custom processing ceased in 1992 and the entire building was deactivated in 1997.

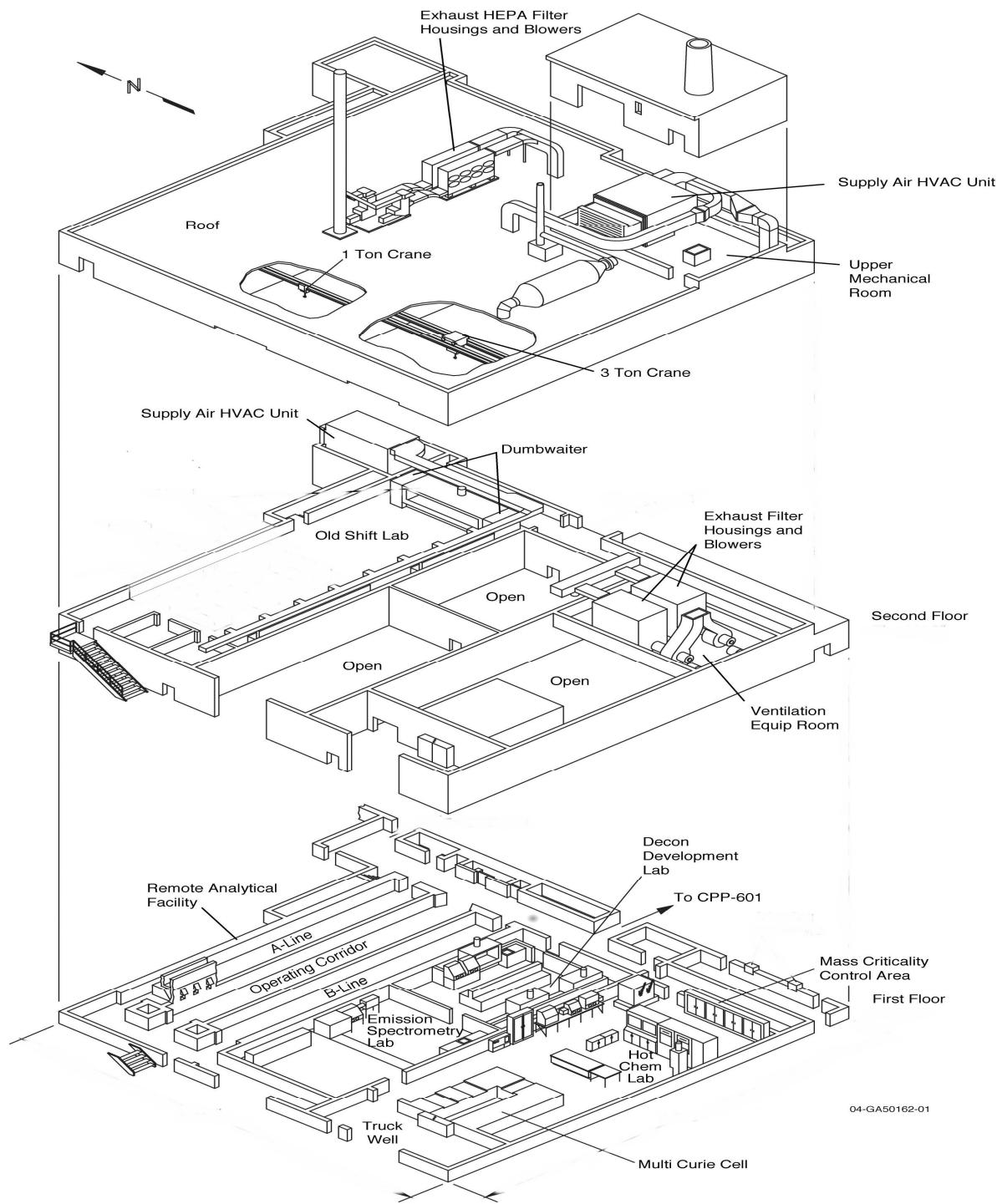


Figure 2-1. Isometric view of the Remote Analytical Facility (Building CPP-627).

### **3. PROJECT HISTORY**

Beginning in December 2003, and in conjunction with the Department of Energy (DOE) request to reduce the Environmental Management footprint at the Idaho National Laboratory (INL) Site, initial planning began on the D&D of the CPP-627 RAF. Due to the perceived radiological and contamination conditions of the building and the possibility of a threat to human health and/or the environment, it was decided that the D&D of this building be completed under a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Non-Time Critical Removal Action (NTCRA) process.

In March 2004, the D&D of CPP-627 began by utilizing construction force account workers. Activities included the removal of contaminated and noncontaminated equipment, decontamination, inactivation of utilities, radiological and waste characterization, engineering design for future D&D activities, and disposal of waste into the Idaho CERCLA Disposal Facility (ICDF). In June 2004, the CPP-627 D&D project was temporarily halted as the current INL (now Idaho Cleanup Project [ICP]) operating contractor, Bechtel BWXT Idaho, LLC, (BBWI) determined how other ongoing ICP projects were to be funded for the remainder of FY-04. The CPP-627 project team used this time to develop more detailed facility structure and A&B Line demolition plans. As part of these activities, IAG-242 was prepared, which is an interface agreement between INTEC and ICDF that enables management and disposal of appropriate waste streams in the ICDF. At the time the project was halted, the following D&D activities had been completed:

- Uncontaminated equipment removed from the facility and sent for reuse on the INL Site
- Laboratory equipment removed from the DDL
- Ninety percent of laboratory equipment removed from the ESL
- Large manipulators, continuous air monitors, remote air monitors, and small gloveboxes removed from the MCC Lab
- Fifty percent of nonasbestos-coated piping removed from the Access Corridor
- Initial radiological surveys taken behind the A&B Lines
- Three of four exhaust stacks removed from the roof of the facility
- Supplemental ventilation systems installed and operating
- Equipment removal in the OSL
- Ninety percent of the buildings electrical isolations completed
- Radiological surveys completed, identifying highly contaminated areas.

The removal to slab of CPP-627 was restarted in October 2004 with a revised scheduled completion date of July 2005. To accomplish this task in this timeframe, a facility and A&B Line demolition plan utilizing excavators and cranes working without an enclosure, and through the winter, was accepted. To complete the scope safely and without release of contamination, additional time was added to the schedule for surface preparation and the application of fixatives in areas that had higher levels of contamination. It was also determined that, whenever contamination was encountered, either

the source would be removed and disposed of or decontamination efforts would be pursued until a decontamination factor of <2.0 was achieved. Surface areas on the interior of the facility and roof were sprayed with at least one coat of fixative. Additional coats of fixative were added until swipe surveys on the dry fixative had <2,000 dpm beta/gamma loose contamination.

Unexpected problems were encountered behind the A&B Lines in February 2005. During decontamination activities on the troughs of the A&B Lines, sample bottles were discovered that contained liquids. Analyses of these bottles indicated U-235. Work was shut down while further analyses were performed. An Engineering Design File (EDF) was developed by the Radiological Engineering, Criticality and Safety Analysis organizations that confirmed that quantities of U-235 and other radioisotopes were below both criticality and hazard category concerns. Safeguards and Accountability also reviewed this EDF to confirm that the quantities of U-235 were below accountability concerns. This issue caused an approximate 6 weeks delay in D&D project activities.

In May 2005, CH2M Hill-Washington Group Idaho, LLC, replaced BBWI as the ICP contractor at the INL Site. The project experienced a brief halt to activities while work processes were reviewed and approved to begin work again. In August 2005, structural demolition began on the CPP-627 building. Several processes were used to control any contamination spread and dust generated from breaking the concrete, including the application of fixatives and water, air monitoring, and continual radiological surveys. Absorbent pigs and a pump were set up to collect water that was then transferred to collection tanks nearby. This water was then disposed of in the ICDF pond. Solid waste transport utilized 25T/35T articulated and tarped dump trucks to prevent release of contamination in transit to the ICDF.

Following the removal of CPP-627, the remaining slab was washed down to remove loose contamination. Consistent with the CERCLA Action Memorandum, a protective layer of concrete was then poured over the entire CPP-627 building footprint to prevent future infiltration of water (DOE-NE-ID 2004a). Lastly, repairs were made to the adjacent buildings that would remain operational at INTEC (CPP-601/-602/-640), such as roof and door repairs and installation of handrails. The contamination remaining under and within the slab will be addressed in a subsequent project that will include the closure of adjacent facilities.